

## Potential Emergence of a Global Pandemic

The emergence of a novel, highly transmissible, and virulent human respiratory illness for which there are no adequate countermeasures could initiate a global pandemic. If a pandemic disease emerges by 2025, internal and cross-border tension and conflict will become more likely as nations struggle—with degraded capabilities—to control the movement of populations seeking to avoid infection or maintain access to resources.

The emergence of a pandemic disease depends upon the natural genetic mutation or reassortment of currently circulating disease strains or the emergence of a new pathogen into the human population. Experts consider highly pathogenic avian influenza (HPAI) strains, such as H5N1, to be likely candidates for such a transformation, but other pathogens—such as the SARS coronavirus or other influenza strains—also have this potential.

If a pandemic disease emerges, it probably will first occur in an area marked by high population density and close association between humans and animals, such as many areas of China and Southeast Asia, where human populations live in close proximity to livestock. Unregulated animal husbandry practices could allow a zoonotic disease such as H5N1 to circulate in livestock populations—increasing the opportunity for mutation into a strain with pandemic potential. To propagate effectively, a disease would have to be transmitted to areas of higher population density.

Under such a scenario, inadequate health-monitoring capability within the nation of origin probably would prevent early identification of the disease. Slow public health response would delay the realization that a highly transmissible pathogen had emerged. Weeks might pass before definitive laboratory results could be obtained confirming the existence of a disease with pandemic potential. In the interim, clusters of the disease would begin to appear in towns and cities within Southeast Asia. Despite limits imposed on international travel, travelers with mild symptoms or who were asymptomatic could carry the disease to other continents.

Waves of new cases would occur every few months. The absence of an effective vaccine and near universal lack of immunity would render populations vulnerable to infection.<sup>a</sup> In this worst-case, tens to hundreds of millions of Americans within the US Homeland would become ill and deaths would mount into the tens of millions.<sup>b</sup> Outside the US, critical infrastructure degradation and economic loss on a global scale would result as approximately a third of the worldwide population became ill and hundreds of millions died.

<sup>a</sup> US and global health organizations currently are working to develop vaccines that may prevent or mitigate influenza pandemics. A breakthrough in the next several years could reduce the risk posed by pandemic influenza during upcoming decades.

<sup>b</sup> How fast a disease spreads, how many people become sick, how long they stay sick, the mortality rate, and the symptoms and after-effects will vary according to the specific characteristics of whatever pathogen is responsible for a pandemic. This scenario posits plausible characteristics that fall within a range of possibilities for these variables.

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Fax: (202) 512-2104; Mail: Stop IDCC, Washington DC 20402-0001

**ISBN 978-0-16-081834-9**

**To view electronic version:**

[www.dni.gov/nic/NIC\\_2025\\_project.html](http://www.dni.gov/nic/NIC_2025_project.html)

*November 2008*

***NIC 2008-003***